

END A<sub>9</sub>

anhydride and polyvinyl pyridine.

A<sup>10</sup>

112. (Amended) The method of claim 1, wherein the particulate material comprises ~~a mixture of inert particles~~ and the particulate reactant.

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115. (Amended) The method of claim 112, wherein the inert particle is selected from the group consisting of a polymer, a ceramic, a metal, an organic material, an inorganic material, a mineral, clay and a salt.

Please add the following new claims.

120. (New) The method of claim 21, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

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121. (New) The method of claim 30, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

122. (New) The method of claim 55, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

123. (New) The method of claim 73, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

124. (New) The method of claim 85, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

A marked-up version of the amended claims is enclosed.

#### Remarks

Claims 1, 21, 27-30, 55, 57, 59, 73, 85, 93, 112 and 115 have been amended. Claims 12-20, 43-54, 61-72, 78-84, 106-111 and 113-114 have been

cancelled. Claims 1-11, 21-42, 55-60, 72-77, 85-105, 112 and 115-119 remain for examination.

Claims 1, 21, 27-30, 55, 57, 59, 73, 85, 93, 112 and 115 have been amended to expedite prosecution. The Applicants believe that the claims as originally filed patentably distinguish over the art and reserve the right to file the originally filed claims in a continuation application.

No new matter has been added.

### Conclusion

A favorable first office action is hereby respectfully requested.

If, for any reason, the Examiner is of the opinion that a telephone conversation with Applicants' representative would expedite prosecution, the Examiner is requested to contact the undersigned at (617) 720-3500.

Please charge any fee or fee deficiency occasioned by this amendment that is not covered by an enclosed check to Deposit Account No. 23/2825.

Respectfully submitted,

  
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**MARKED-UP CLAIMS**

1. (Amended) A method of three-dimensional printing, comprising:
  - providing a first layer of [dry] free-flowing particulate material comprising an ionic reactant;
  - dispensing a homogeneous fluid onto a first region of the first layer, the fluid comprising an ionic reactant and the first region being contiguous with a second region comprising the free-flowing particulate material; [and]
  - allowing an ion exchange reaction to occur between the particulate reactant and the reactant in the fluid, the reaction causing a solidified material to form in the first region;
  - providing a second layer of the particulate material over the first layer; and
  - dispensing the fluid onto a first region of the second layer.
  
21. (Amended) A method of three-dimensional printing, comprising:
  - providing a first layer of a [dry] free-flowing particulate material comprising a reactant selected from the group consisting of metals, minerals and ceramic oxides;
  - dispensing a homogeneous fluid onto a first region of the first layer, the fluid comprising a reactant and the first region being contiguous with a second region comprising the free-flowing particulate material; [and]
  - allowing a reaction to occur between the particulate reactant and the reactant in the fluid, the reaction causing a solidified material to form in the first region;
  - providing a second layer of the particulate material over the first layer; and
  - dispensing the fluid onto a first region of the second layer.
  
27. (Amended) The method of claim [22] **21**, wherein the reactant is a metal [is] selected from the group consisting of iron, copper, carbon steel, stainless steel, aluminum, brass, molybdenum, tungsten, magnesium, and cobalt.

28. (Amended) The method of claim [26] 21, wherein the reactant is a ceramic oxide [is] selected from the group consisting of alumina ( $\text{Al}_2\text{O}_3$ ), anatase ( $\text{TiO}_2$ ), silicon dioxide, aluminum silicate and glass.

29. (Amended) The method of claim [26] 21, wherein the reactant is a mineral [is] selected from the group consisting of limestone ( $\text{CaCO}_3$ ), magnetite, calcium silicate ( $\text{CaSiO}_4$ ), hydrous calcium sulfate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), hydrated lime ( $\text{Ca}(\text{OH})_2$ ) and calcium phosphate.

30. (Amended) A method of three-dimensional printing, comprising:  
providing a first layer of a [dry] free-flowing particulate material comprising a particles having a reactive surface;  
dispensing a fluid onto a first region of the first layer, the fluid comprising a reactant and the first region being contiguous with a second region comprising the free-flowing particulate material; [and]  
allowing a reaction to occur between the reactive polymer and the reactant in the fluid, the reaction causing a solidified material to form in the first region;  
providing a second layer of the particulate material over the first layer; and  
dispensing the fluid onto a first region of the second layer.

55. (Amended) A method of three-dimensional printing, comprising:  
providing a first layer of a [dry] free-flowing particulate material comprising a reactant;  
dispensing a fluid onto a first region of the first layer, the fluid comprising a reactant and the first region being contiguous with a second region comprising the free-flowing particulate material; [and]  
allowing a reaction to occur between the particulate reactant and the reactant to form an adhesive, the reaction causing a solidified material to form in the first region;

providing a second layer of the particulate material over the first layer; and  
dispensing the fluid onto a first region of the second layer.

57. (Amended) The method of claim 56, wherein the reactant in the fluid is selected from the group consisting of 2-amino-2-methyl 1-propanol (AMP), polyethyleneimine 2-amino-2-methyl 1-3 propanediol (AMPD), 2-amino-2-ethyl 1-3-propanediol (AEPD), and a hydroxide.

59. (Amended) The method of claim 55, wherein the particulate reactant is selected from the group consisting of [urea, a phenolic resin and melamine] sodium carbonate and potassium aluminum sulfate.

73. (Amended) A method of three-dimensional printing, comprising:  
providing a first layer of a [dry] free-flowing particulate material comprising an adhesive;  
dispensing a first fluid onto the first layer to dissolve the adhesive;  
dispensing a fluid solidifying agent onto a first region of the first layer and the first region being contiguous with a second region comprising the free-flowing particulate material; [and]  
allowing a reaction to occur between the first fluid and the solidifying agent, the reaction causing a solidified material to form in the first region;  
providing a second layer of the particulate material over the first layer; and  
dispensing the fluid onto a first region of the second layer.

85. (Amended) A method of three-dimensional printing, comprising:  
providing a first layer of a [dry] free-flowing particulate material comprising a first reactant and a second reactant;  
dispensing a fluid onto a region of the first layer and the first region being contiguous with a second region comprising the free-flowing particulate material;  
[and]

allowing a reaction between the first and second reactants to occur, the reaction causing a solidified material to form in the first region;  
providing a second layer of the particulate material over the first layer; and  
dispensing the fluid onto a first region of the second layer.

93. (Amended) The method of claim 92, wherein the anionic polyelectrolyte is selected from the group consisting of sulfonated polystyrene, polyacrylic acid, polymethacrylic acid, polyvinyl sulfonic acid, alkali metal salts of polyacrylic acid, alkali metal salts of polymethacrylic acid, alkali metal salts of polyvinyl sulfonic acid, ammonium salt of polyvinyl sulfonic acid, ammonium salt of sulfonated polystyrene, ammonium salt of polyacrylic acid, ammonium salt of polymethacrylic acid, copolymer of sodium styrene sulfonate with maleic anhydride[, polyethylene oxide,] and polyvinyl pyridine[, polyethylene glycol and polyvinylpyrrolidone].

112. (Amended) The method of [any one of claims 1, 12, 21, 30, 43, 55, 61, 63, 67, 73, 78 and 85] claim 1, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

115. (Amended) The method of [any one of claims 1, 12, 21, 30, 43, 55, 61, 63, 67, 73, 78 and 85] claim 112, wherein the inert particle is selected from the group consisting of a polymer, a ceramic, a metal, an organic material, an inorganic material, a mineral, clay and a salt.

120. (New) The method claim 21, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

121. (New) The method claim 30, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

122. (New) The method claim 55, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

123. (New) The method claim 73, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.

124. (New) The method claim 85, wherein the particulate material comprises a mixture of inert particles and the particulate reactant.